

welcome

to the

AWARD WINNING

E4

av tour



PRESENTED BY



E4 av tour

#E4AVTOUR

WHAT WILL YOUR
*Lightbulb
Moment*
BE?



New York

SEPTEMBER 19TH

TEANECK MARRIOTT

4K: NO MYTHS NO EXAGGERATIONS JUST THE FACTS

GARY KAYYE



Everything you REALLY need to know on how to specify, sell and integrate 4K systems right the first time.

No myths, no “spec talk” – just the facts.

BARCO

See you on the Internet.



You
Tube



@rAVePubs



CERTIFIED

TECHNOLOGY

CTS

info **Comm**

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Document Audio

Theme
White
Change Theme

Slideshow Settings

- Automatically play upon open
- Loop slideshow
Press 'Esc' key to exit
- Restart show if idle for
15 m

Presentation Type

Normal

Delay: 5.0 s Transitions 2.0 s Builds

Slide Size

Custom (3840 x 2160)

Require password to open
Change Password...

Transitions

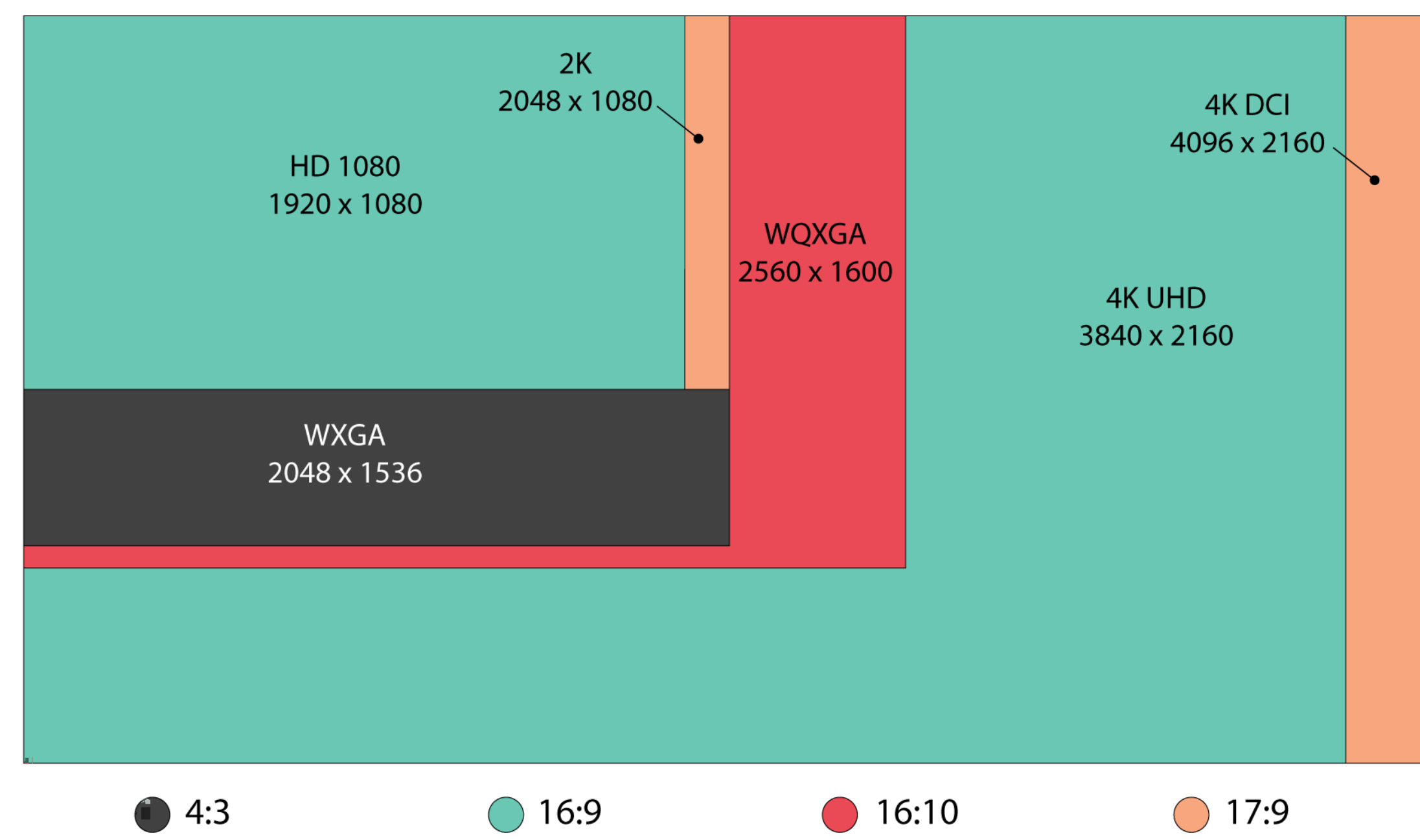
Builds

Slide Size

Custom (3840 x 2160)

Require password to open





The Evolution of Resolution

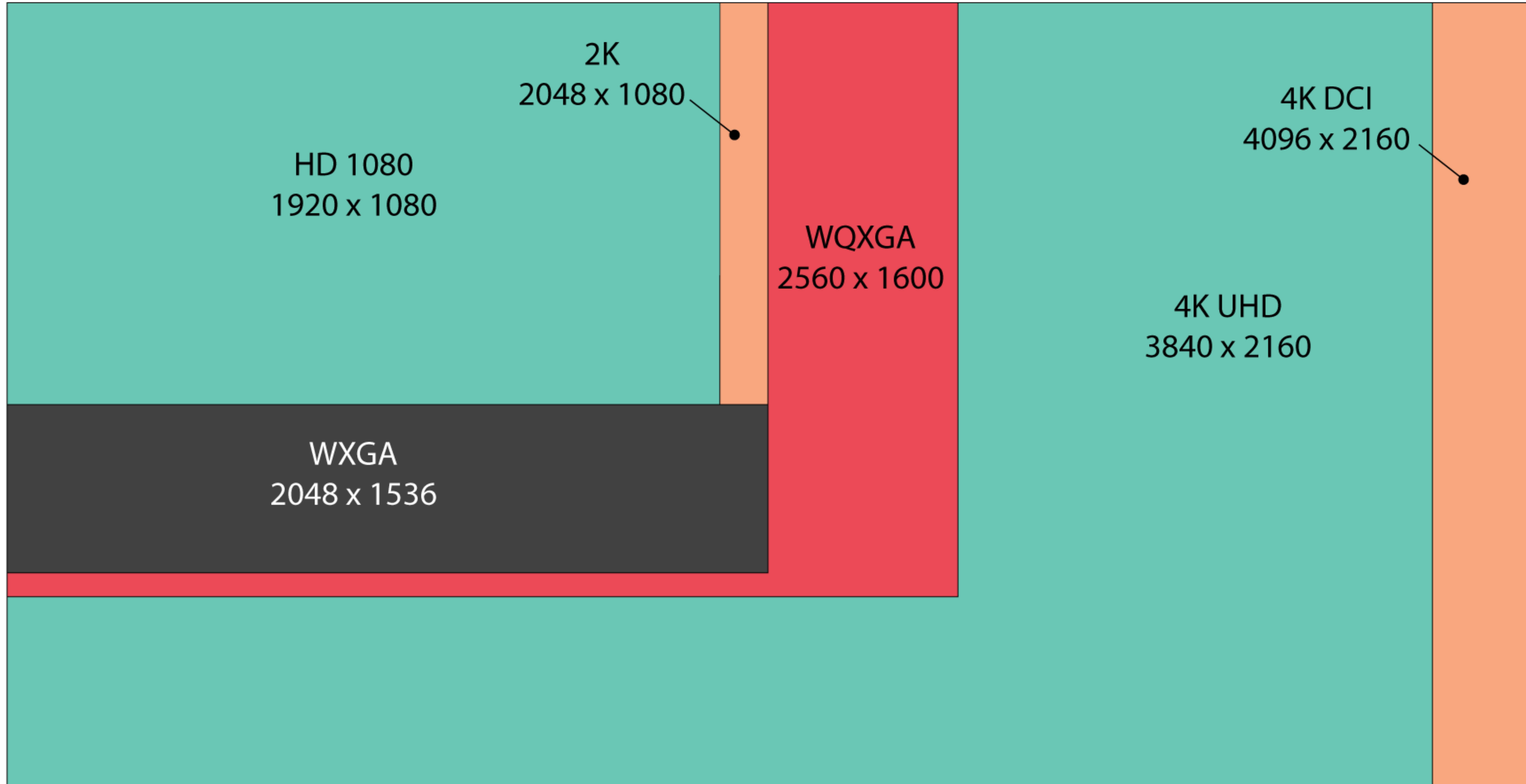
Beyond the Hype- What is 4K?

4K in ProAV?

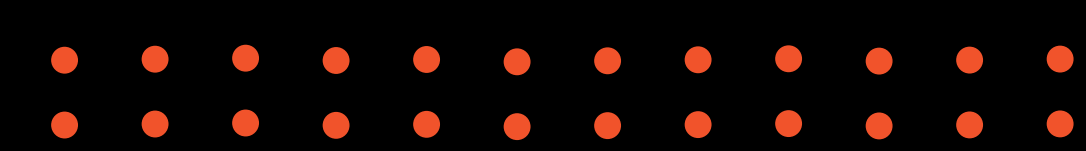
The Digital Canvas

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The Evolution of Resolution



4K vs. UHD

SMPTTE TV *vs.* DCI

Video Resolutions from 480 to 4K



● **4:3**

● **16:9**

● **16:10**

● **17:9**

Video Resolutions from 480 to 4K



640 x 480

● **4:3**

● **16:9**

● **16:10**

● **17:9**

Video Resolutions from 480 to 4K



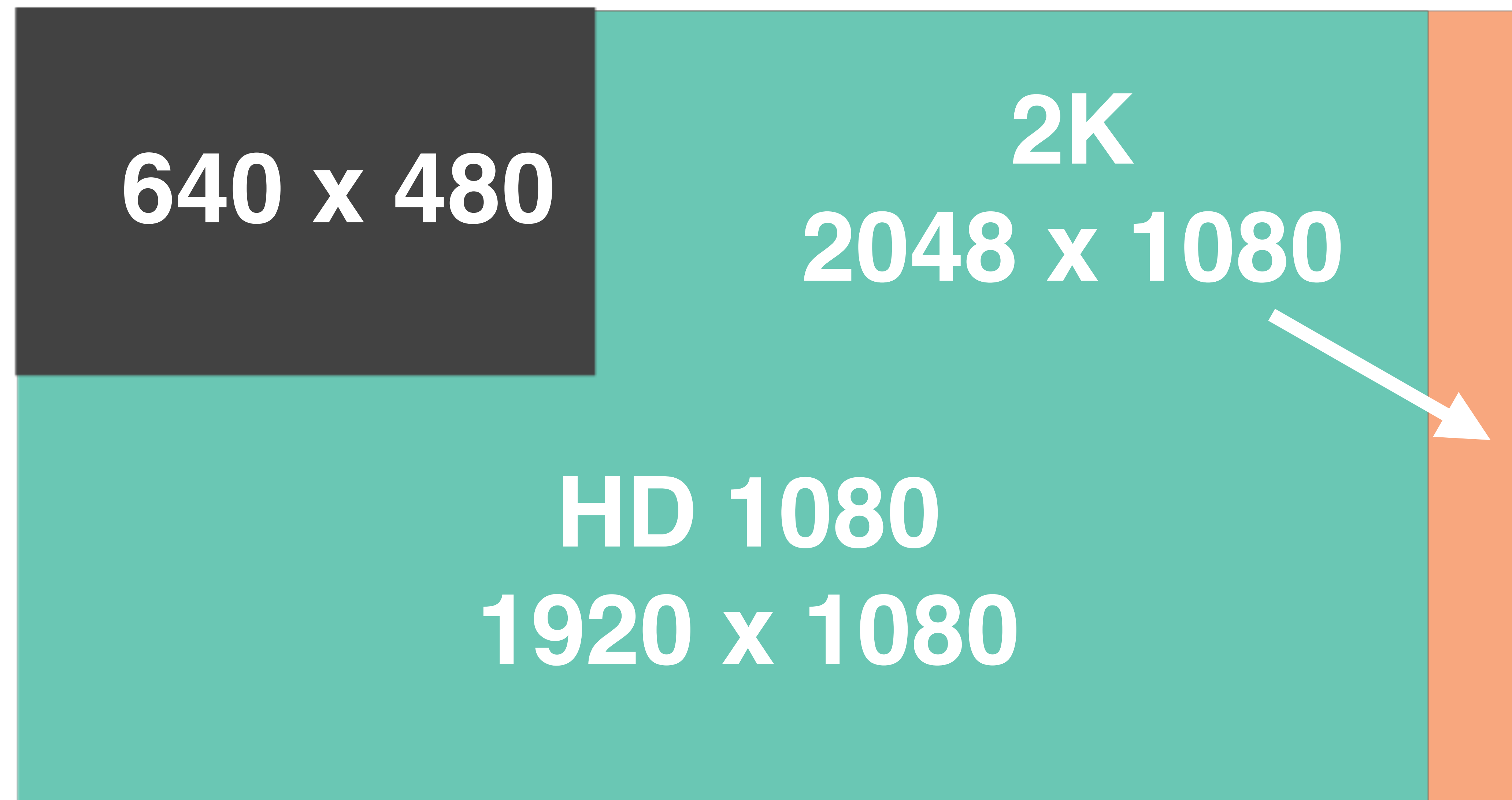
● **4:3**

● **16:9**

● **16:10**

● **17:9**

Video Resolutions from 480 to 4K



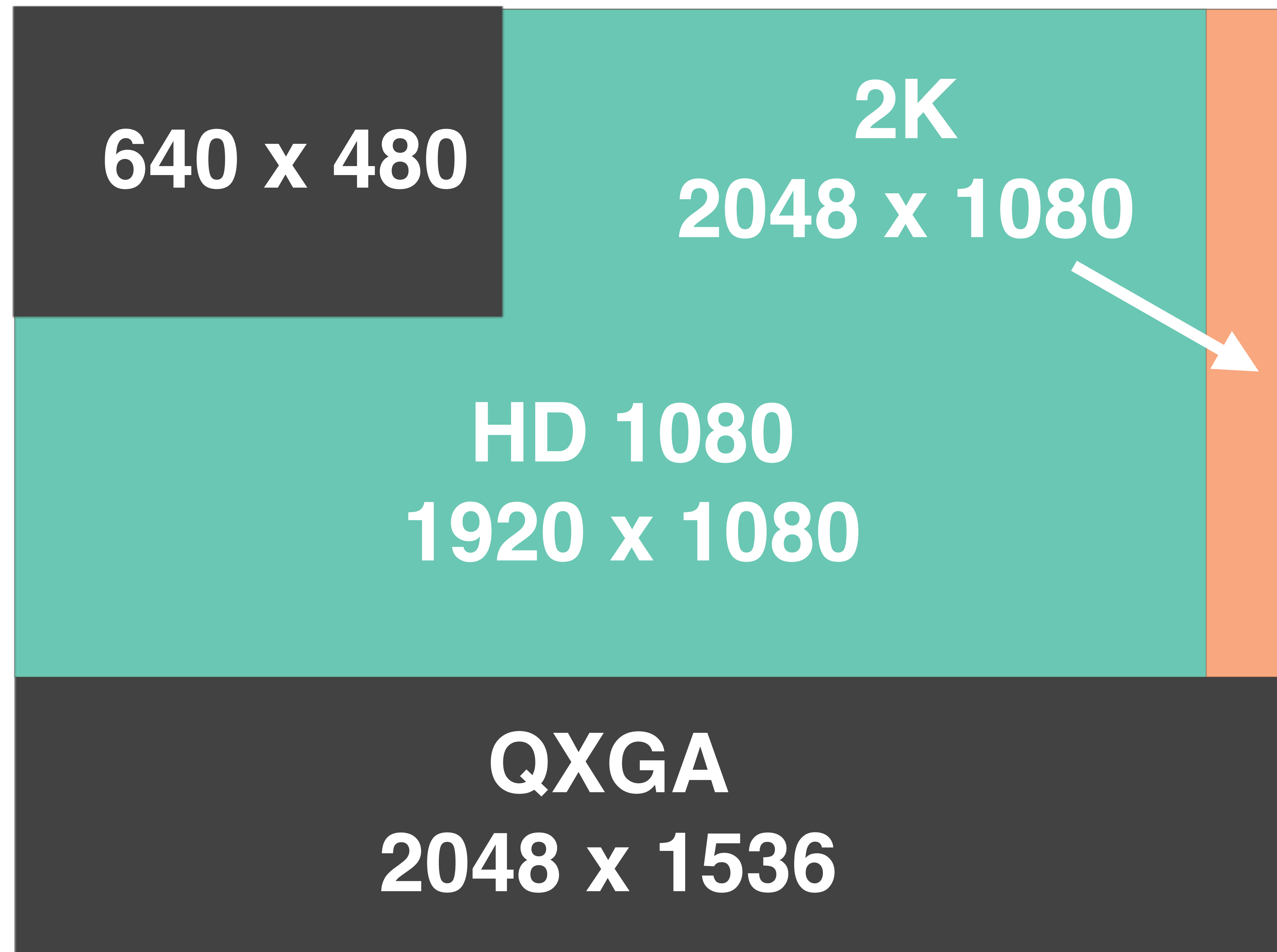
● **4:3**

● **16:9**

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Video Resolutions from 480 to 4K



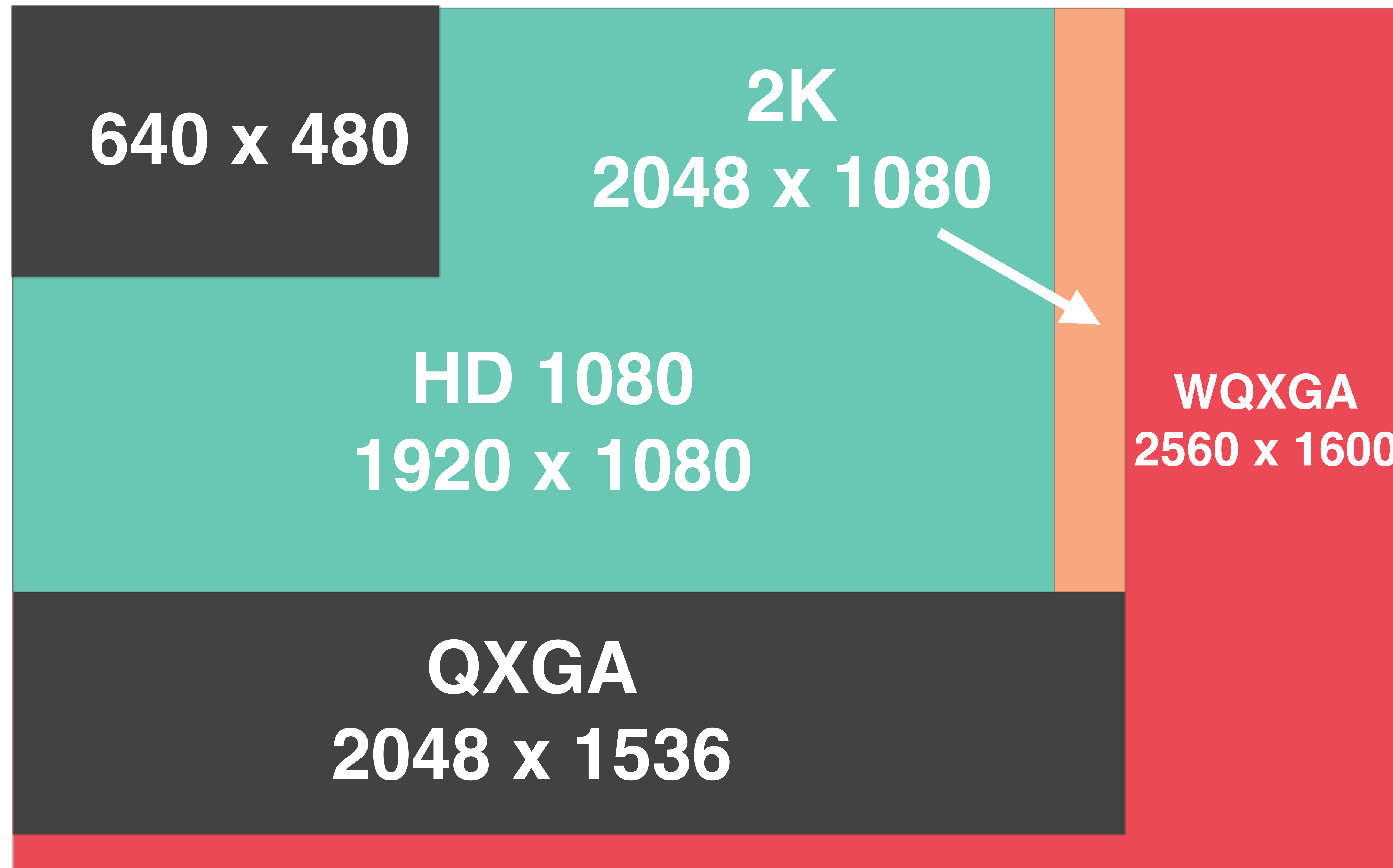
● **4:3**

● **16:9**

● **16:10**

● **17:9**

Video Resolutions from 480 to 4K



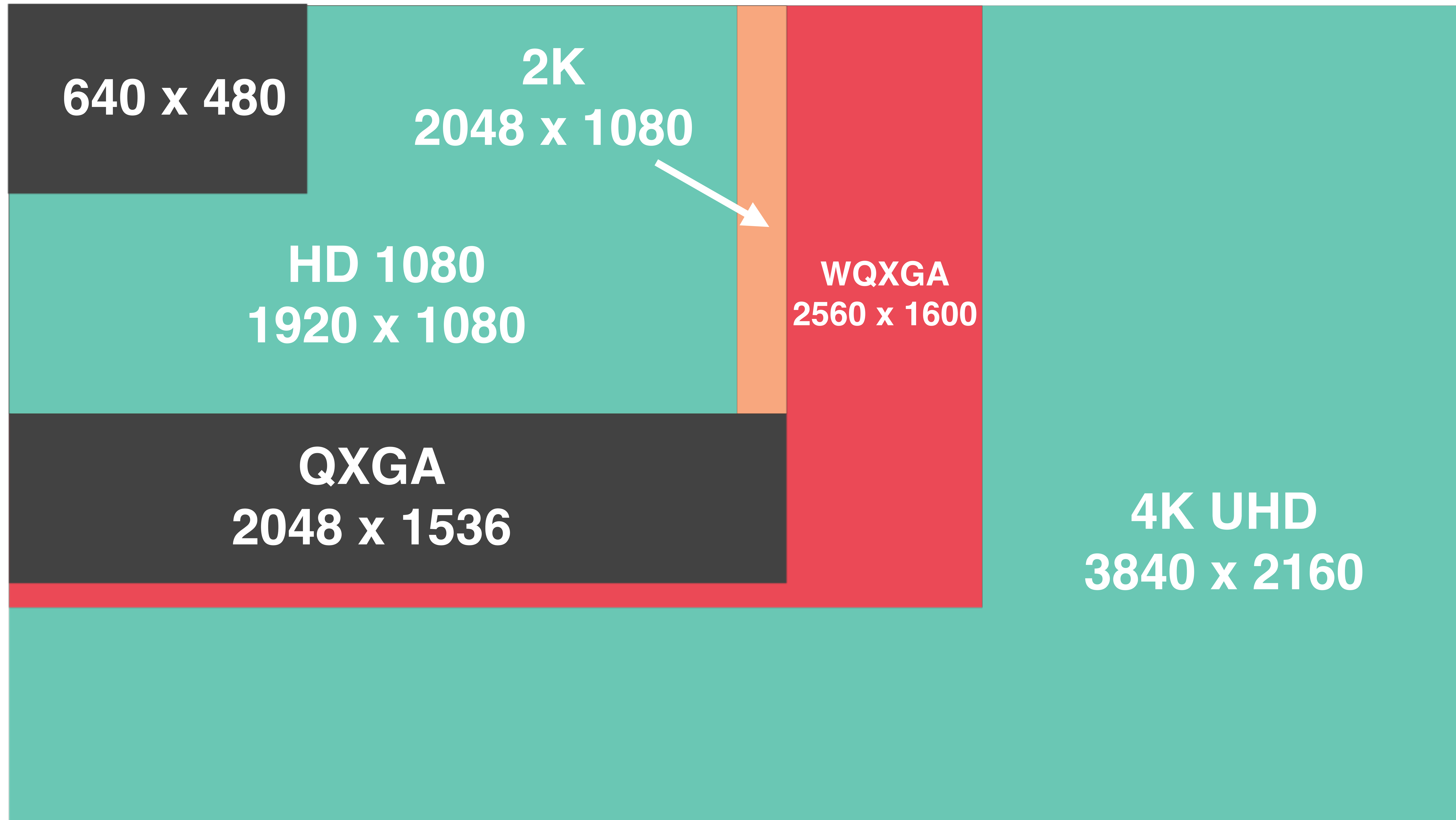
● **4:3**

● **16:9**

● **16:10**

● **17:9**

Video Resolutions from 480 to 4K



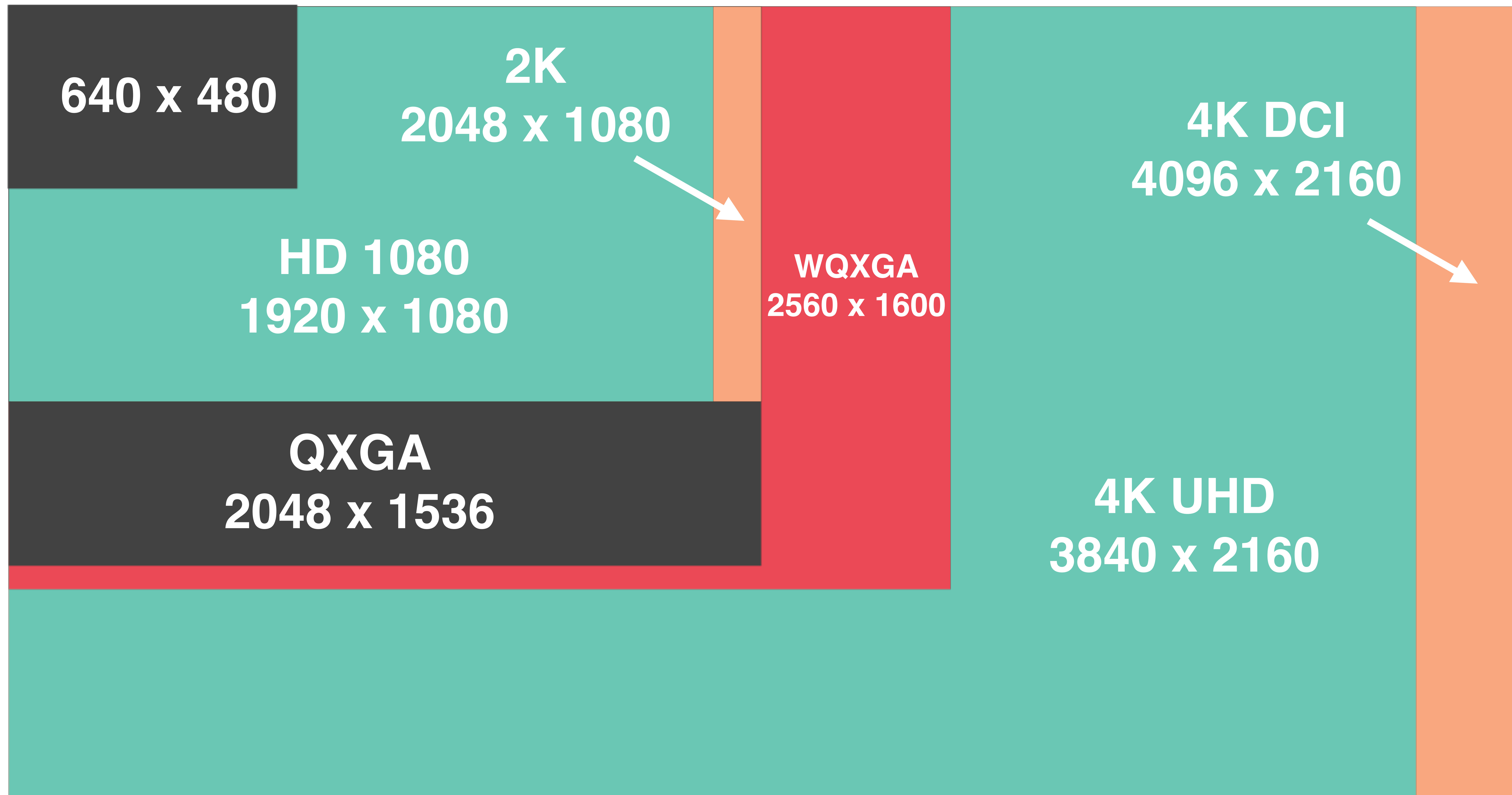
● **4:3**

● **16:9**

● **16:10**

● **17:9**

Video Resolutions from 480 to 4K



● **4:3**

● **16:9**

● **16:10**

● **17:9**



4K UHD vs. 4K DCI

16:9

17:9

3840x2160

4096x2160

720p @ 60Hz

1080 @ 60Hz

4K UHD @ 30Hz

4K UHD @ 60Hz

Is More Better?

UHDTV1 = 3840 x 2160

4K

UHDTV2 = 7680 x 4320

8K



UGH!





planet

THE COSMOPOLITAN

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M

MIRACLE MILE SHOPS

Flamingo Las Vegas

BELLAGIO

O

GROUP OF BUILDINGS

ria

ARKANA
A VISUALLY STUNNING ACROBATIC SPECTACULAR

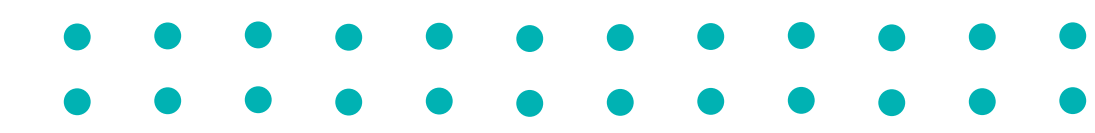








All you have to remember is...



TV & Video

**3840 x 2160
fps?**



Film & Movies

**4096 x 2160
fps?**

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Thanks for the **PLETHORA**
of standards.



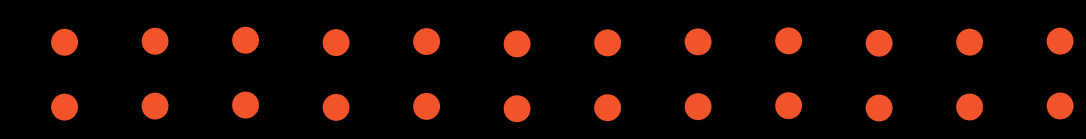
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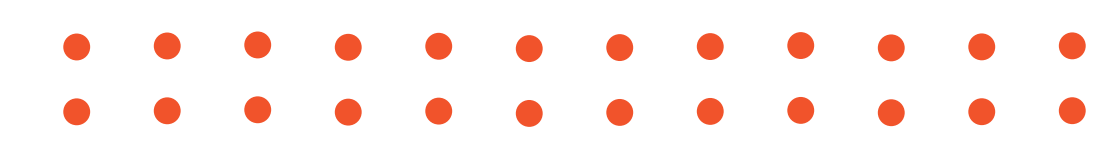




Beyond the Hype - What is 4K?



Primary 4K Factors



Resolution

Frame Rate

Chroma Sampling

Pixel Clock

Color Bandwidth



Resolution
Were you
paying attention?

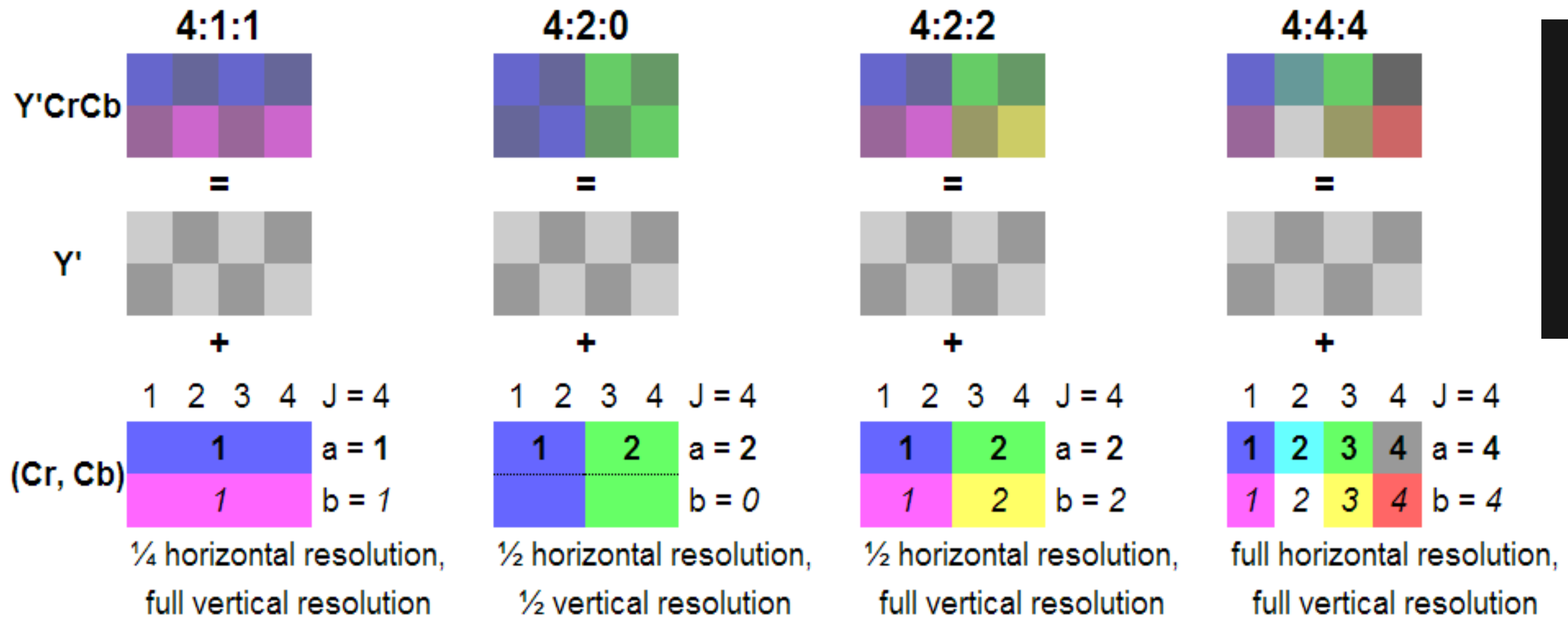
3840 x 2160

.....

4096 x 2160

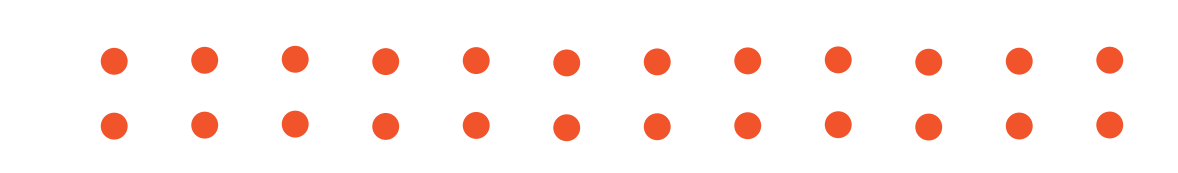
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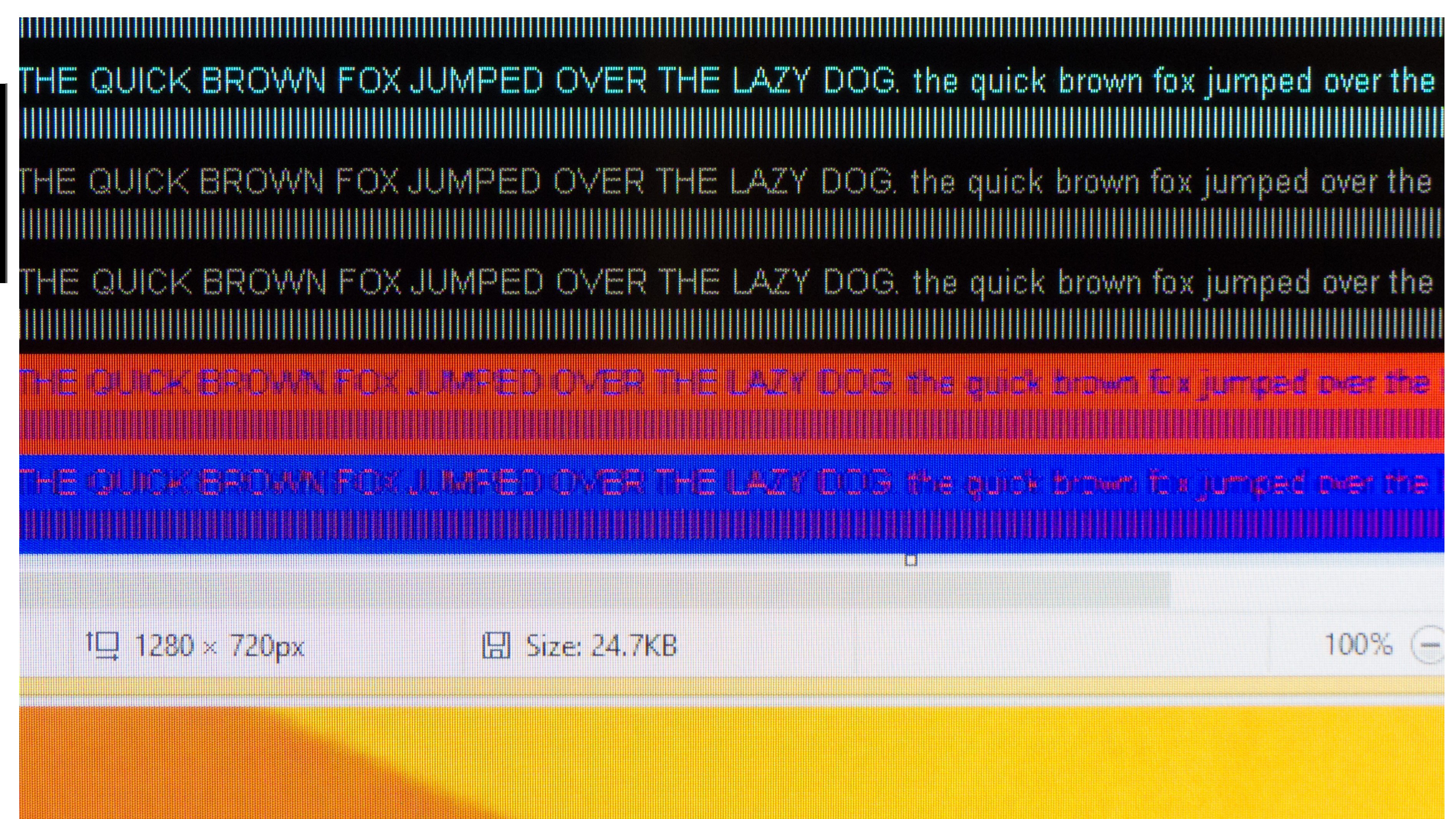
Frame Rate & Chroma Sampling

The DNA of a Pixel



The Spec You Want to Watch For:

Resolution	Frame Rate	Chroma Sub-sampling
4K / UHD	30 Hz	4:4:4
4K / UHD	60 Hz	4:2:0
4K / UHD	60 Hz	4:4:4



ROWN FOX JUMPED OVER THE LAZY DOG. the quick brown fox ju

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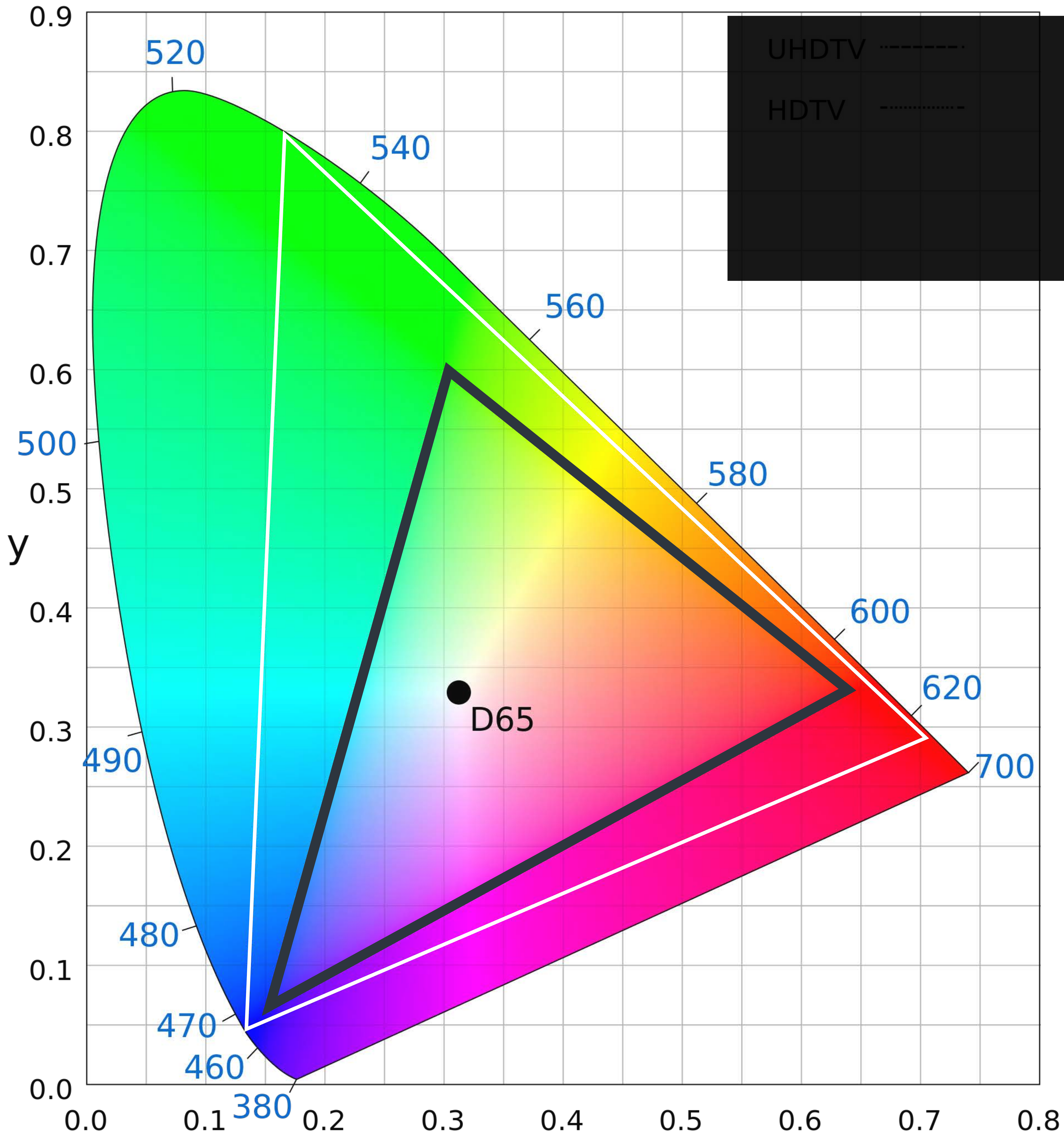
ROWN FOX JUMPED OVER THE LAZY DOG. the quick brown fox ju

Pixel Clock (bandwidth)

Resolution	Frame Rate	Chroma Subsampling	Color Depth	Pixel Clock	Data Rate
1080p	60 Hz	4:4:4	8-Bit	148.5 MHz	211 MB/s
4K / UHD	30 Hz	4:4:4	8-Bit	297.00 MHz	8.91 Gbps
4K / UHD	60 Hz	4:2:0	8-Bit	594.00 MHz	8.91 Gbps
4K / UHD	60 Hz	4:4:4	8-Bit	594.00 MHz	17.82 Gbps
4K / UHD	60 Hz	4:4:4	10-Bit	594.00 MHz	22.28 Gbps
4K / UHD	60 Hz	4:4:4	12-Bit	594.00 MHz	26.73 Gbps
4K / UHD	60 Hz	4:4:4	16-Bit	594.00 MHz	35.64 Gbps

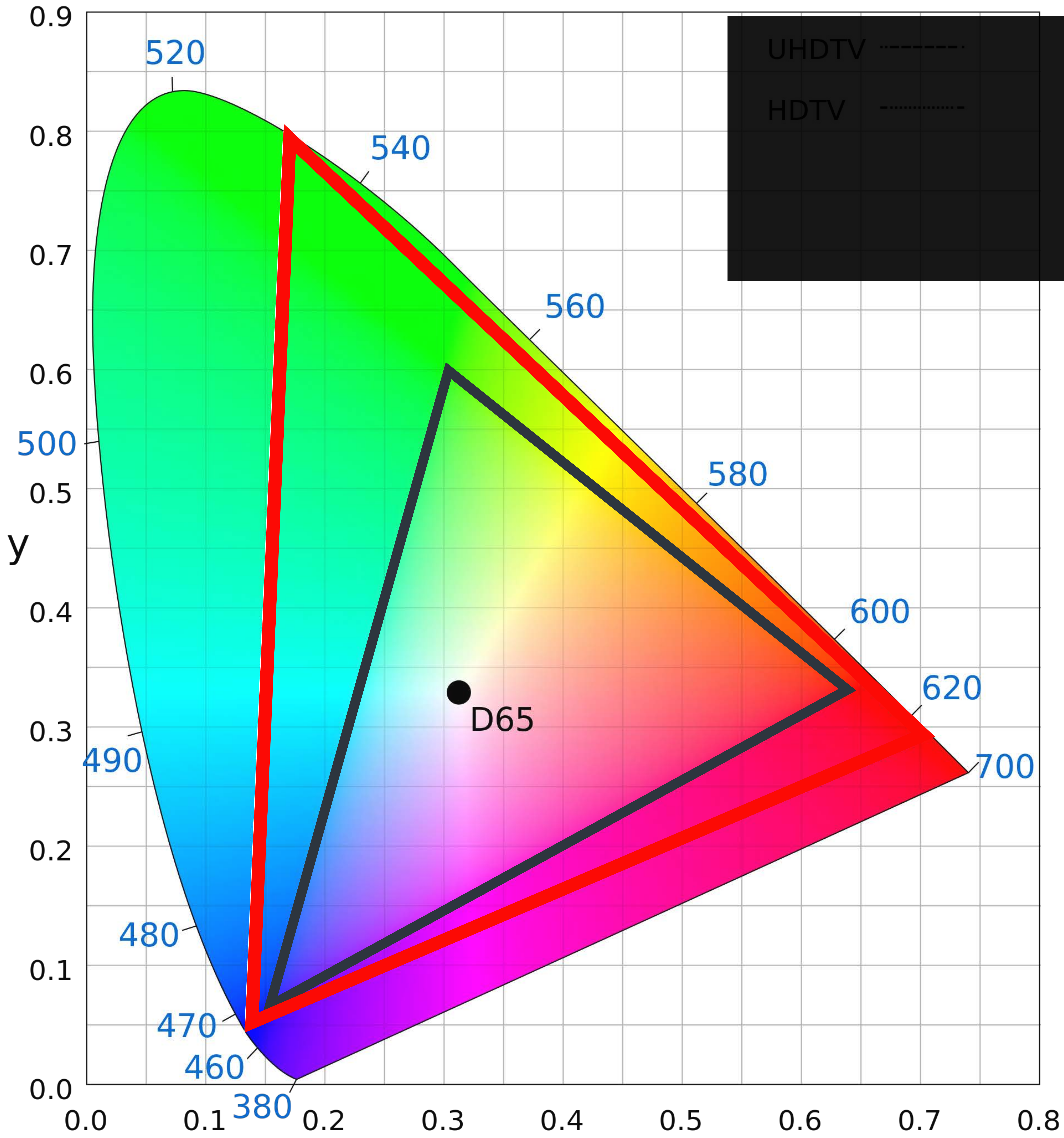
Color Bandwidth

●
D65



Color Bandwidth

UHDTV
HDTV

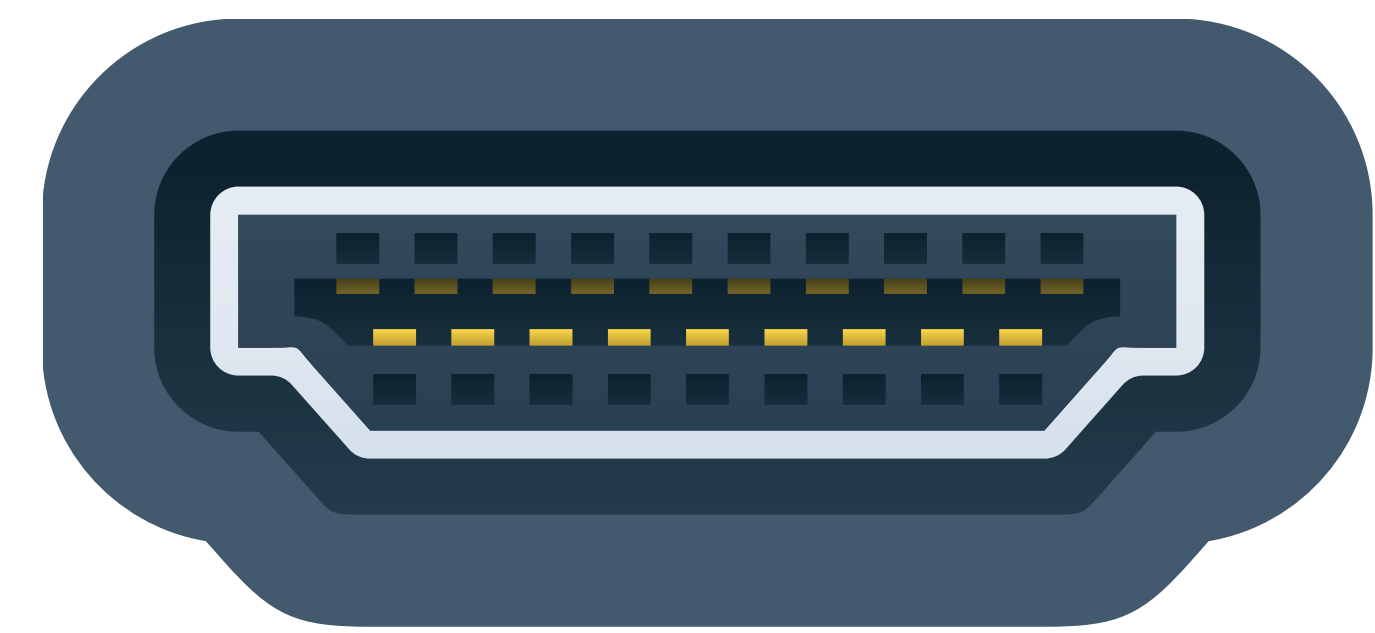


Color Bandwidth

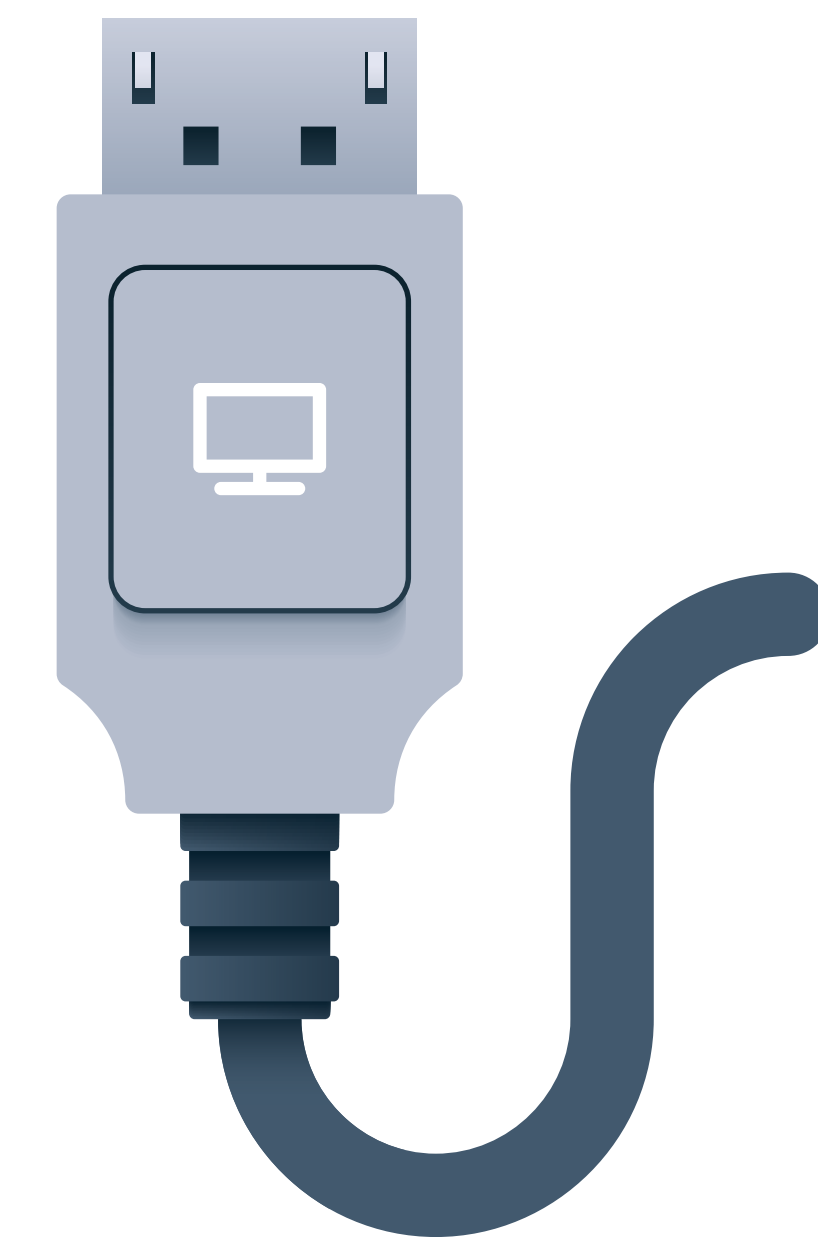
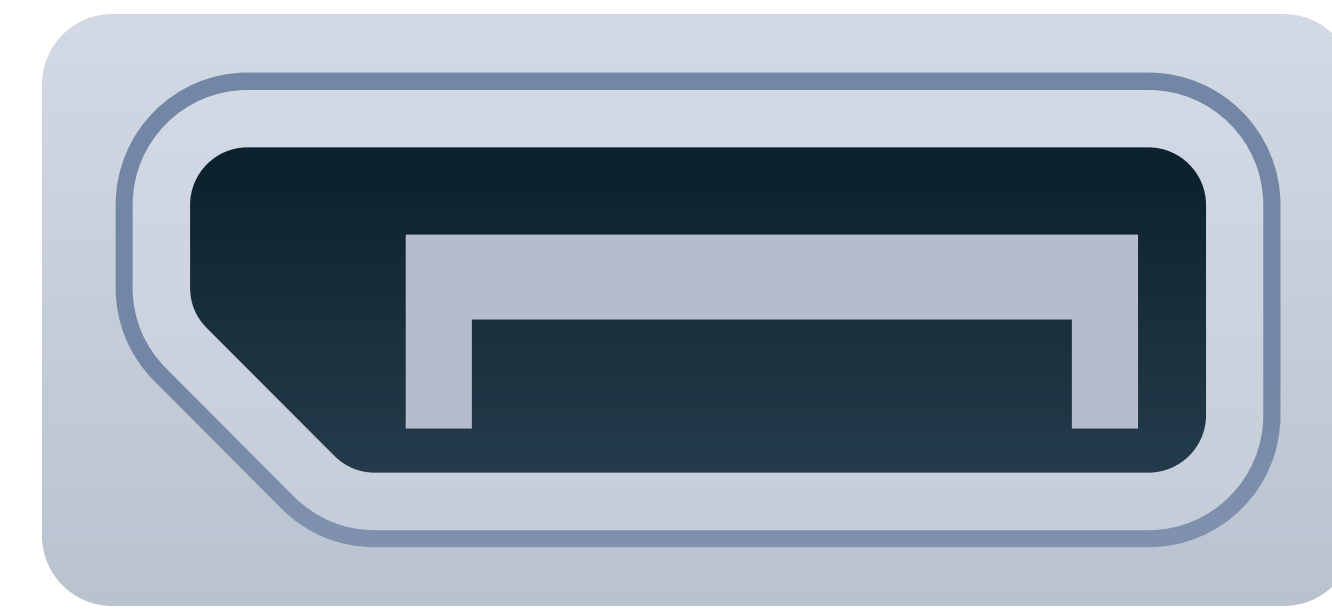




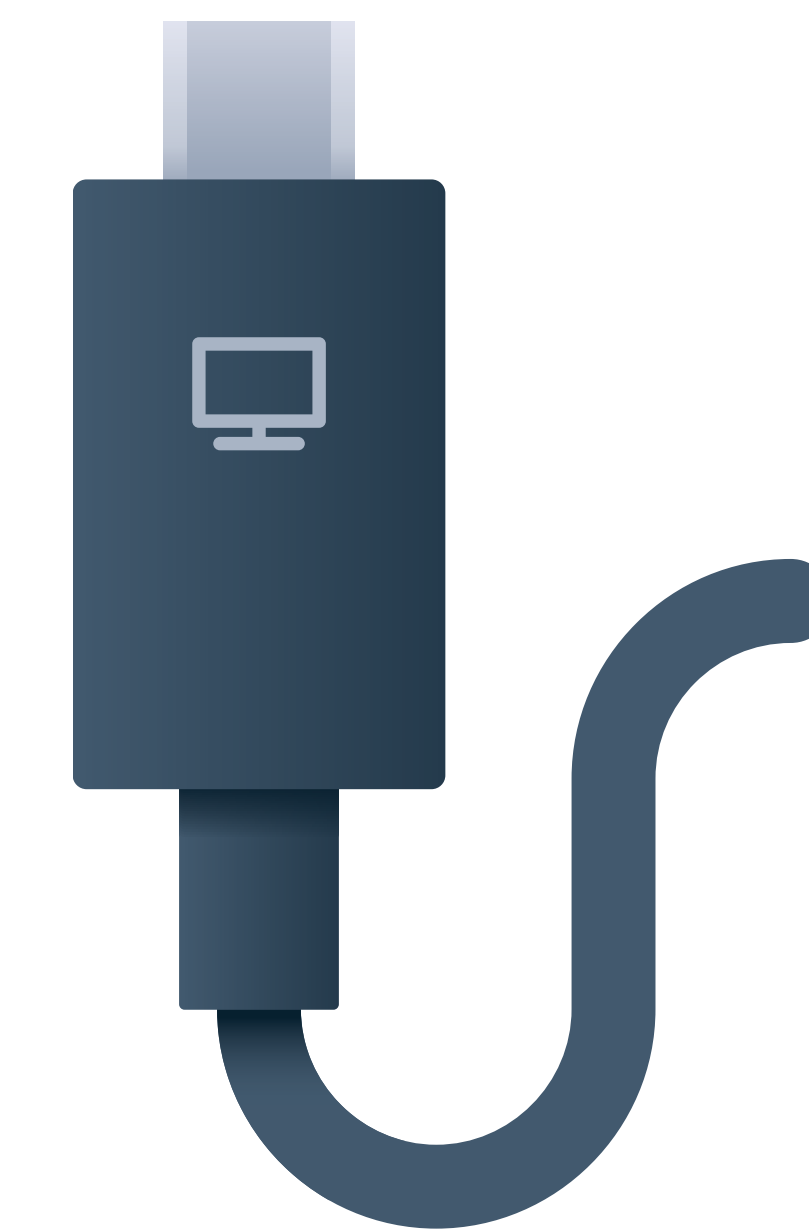
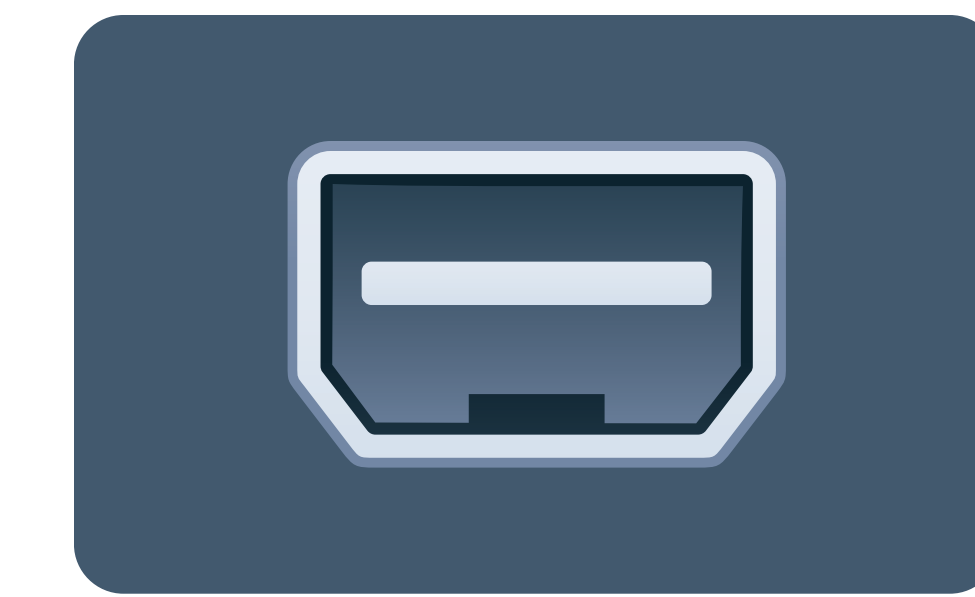
THE 4K PIPE



HDMI



DisplayPort

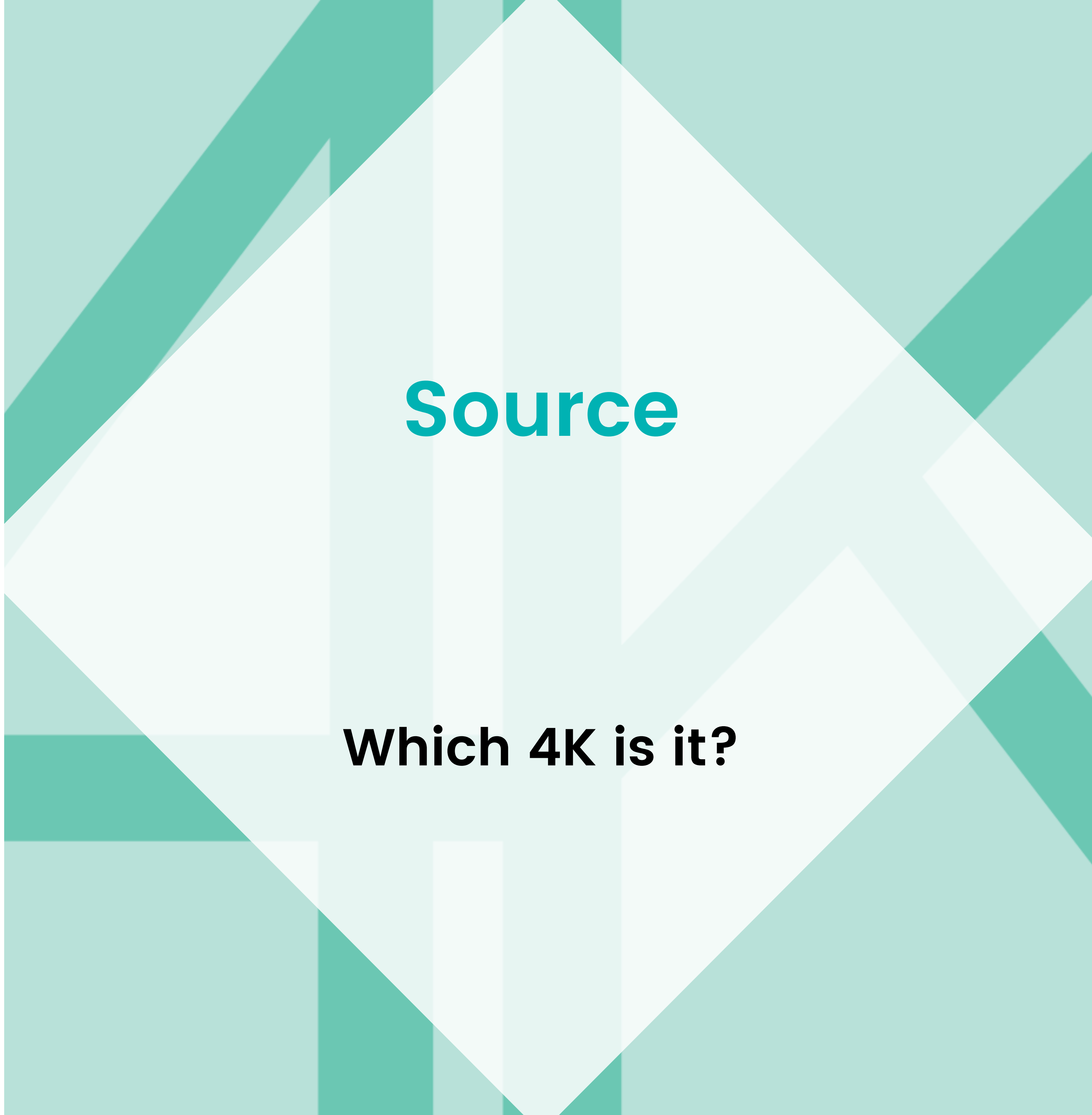


Mini DisplayPort

Sponsored by:

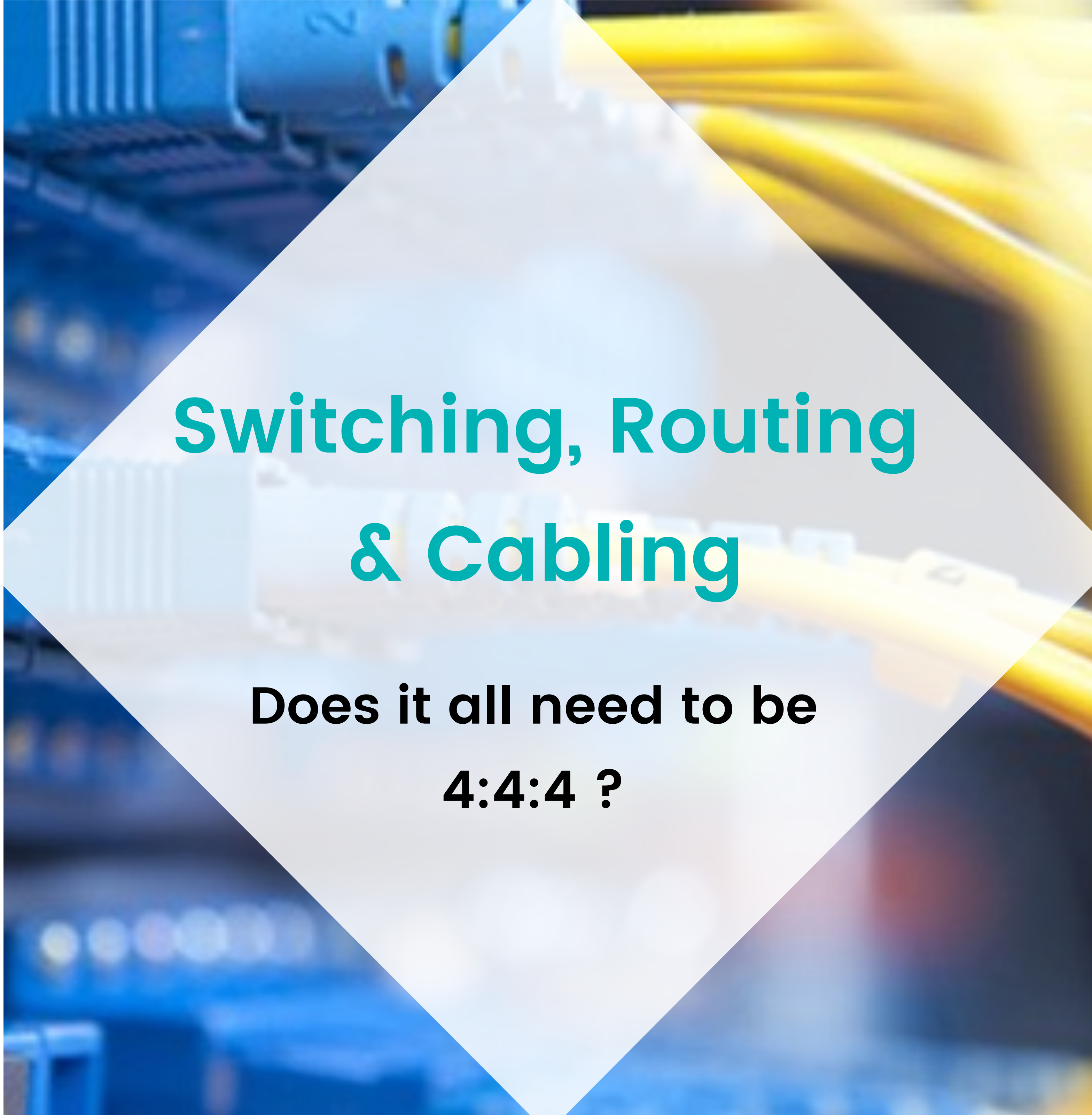


SIGNAL ROUTING 4K



Source

Which 4K is it?



**Switching, Routing
& Cabling**

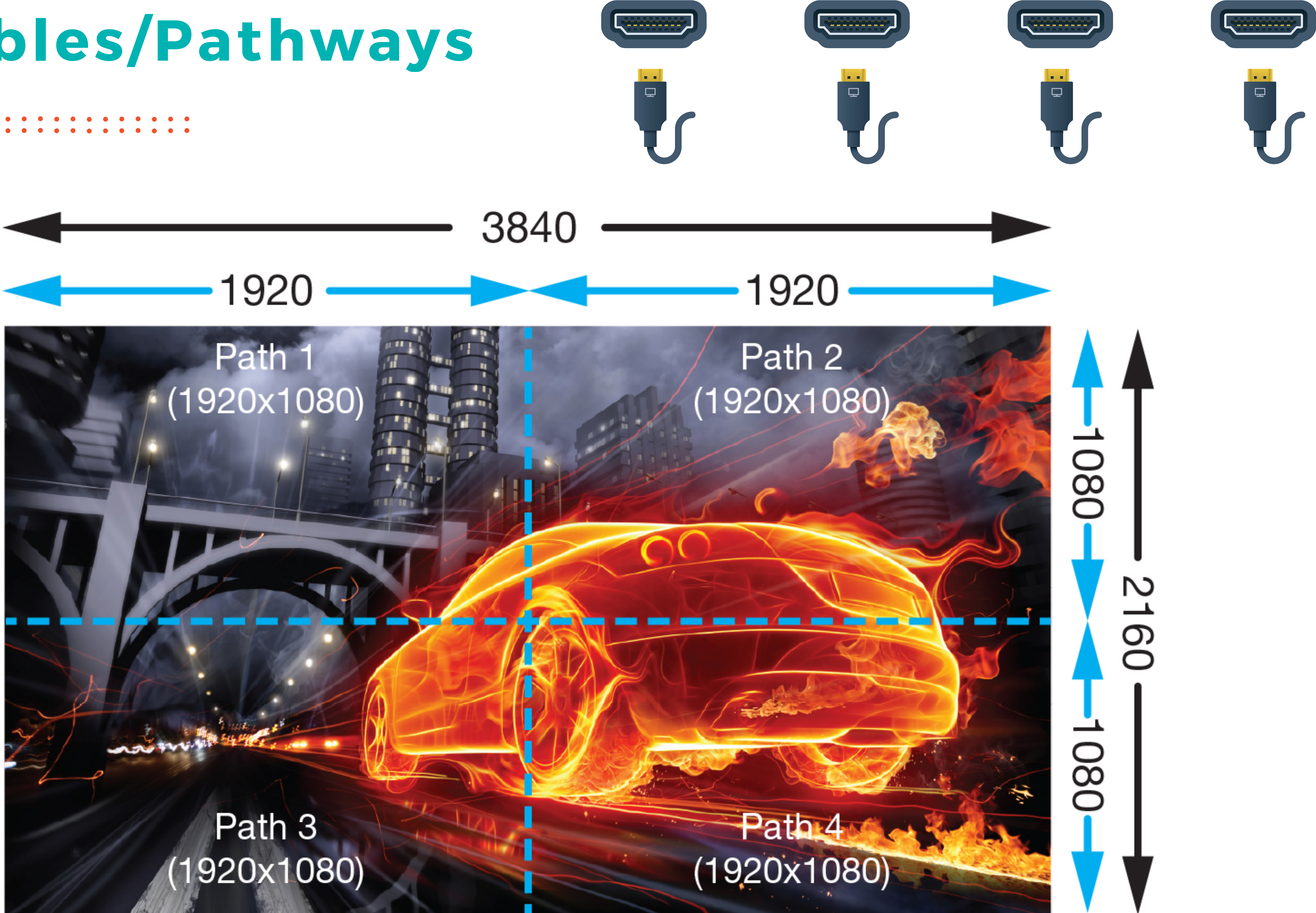
Does it all need to be
4:4:4 ?



Display

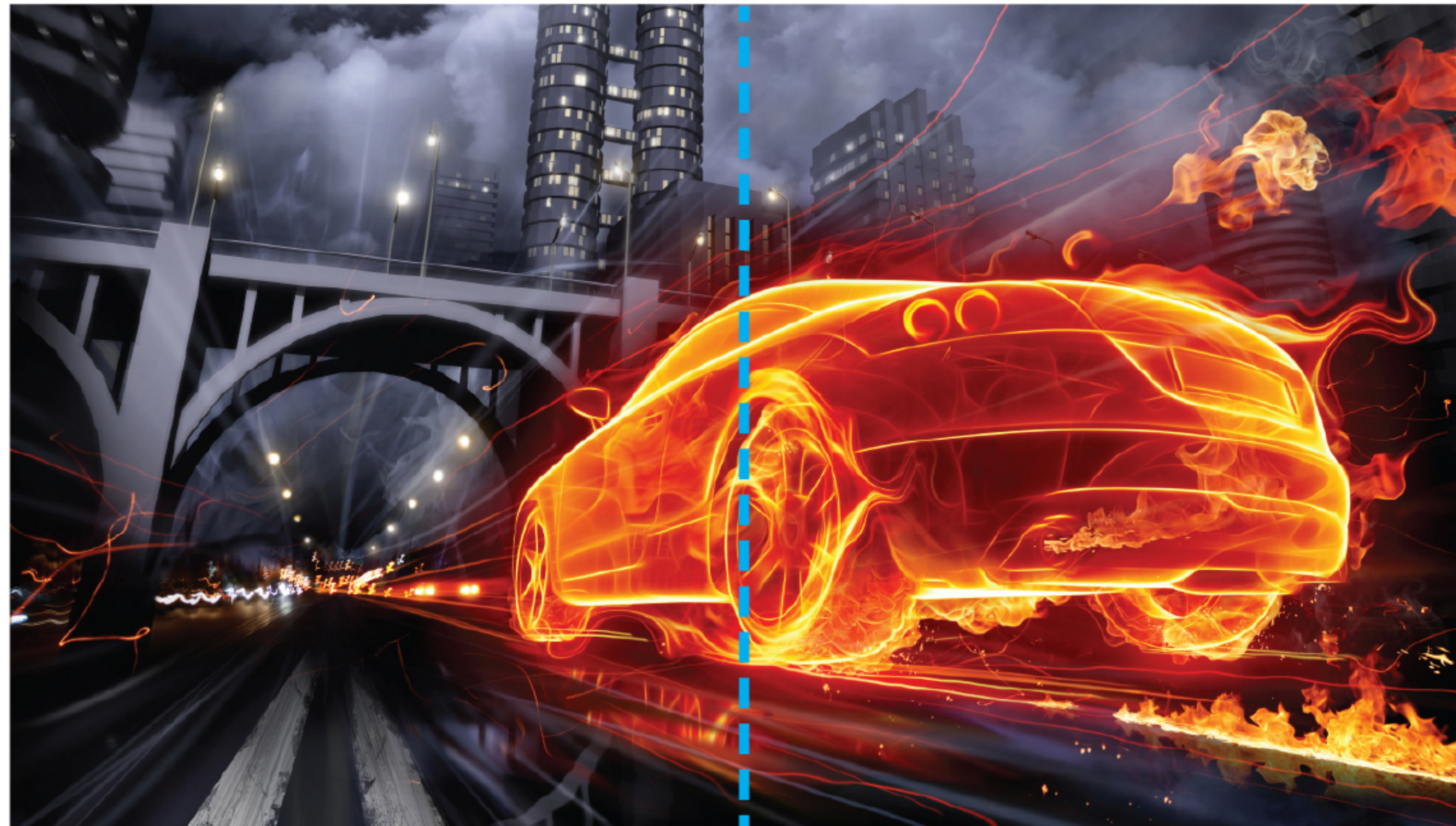
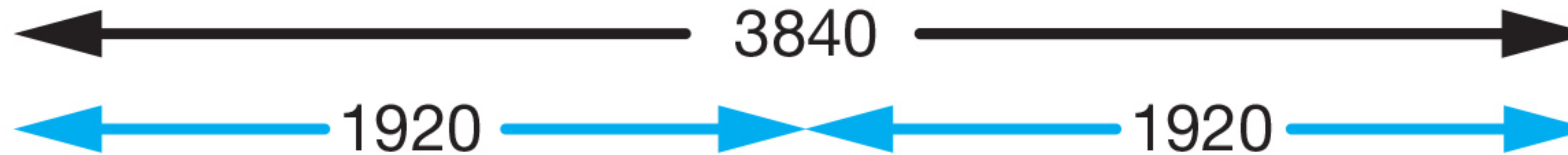
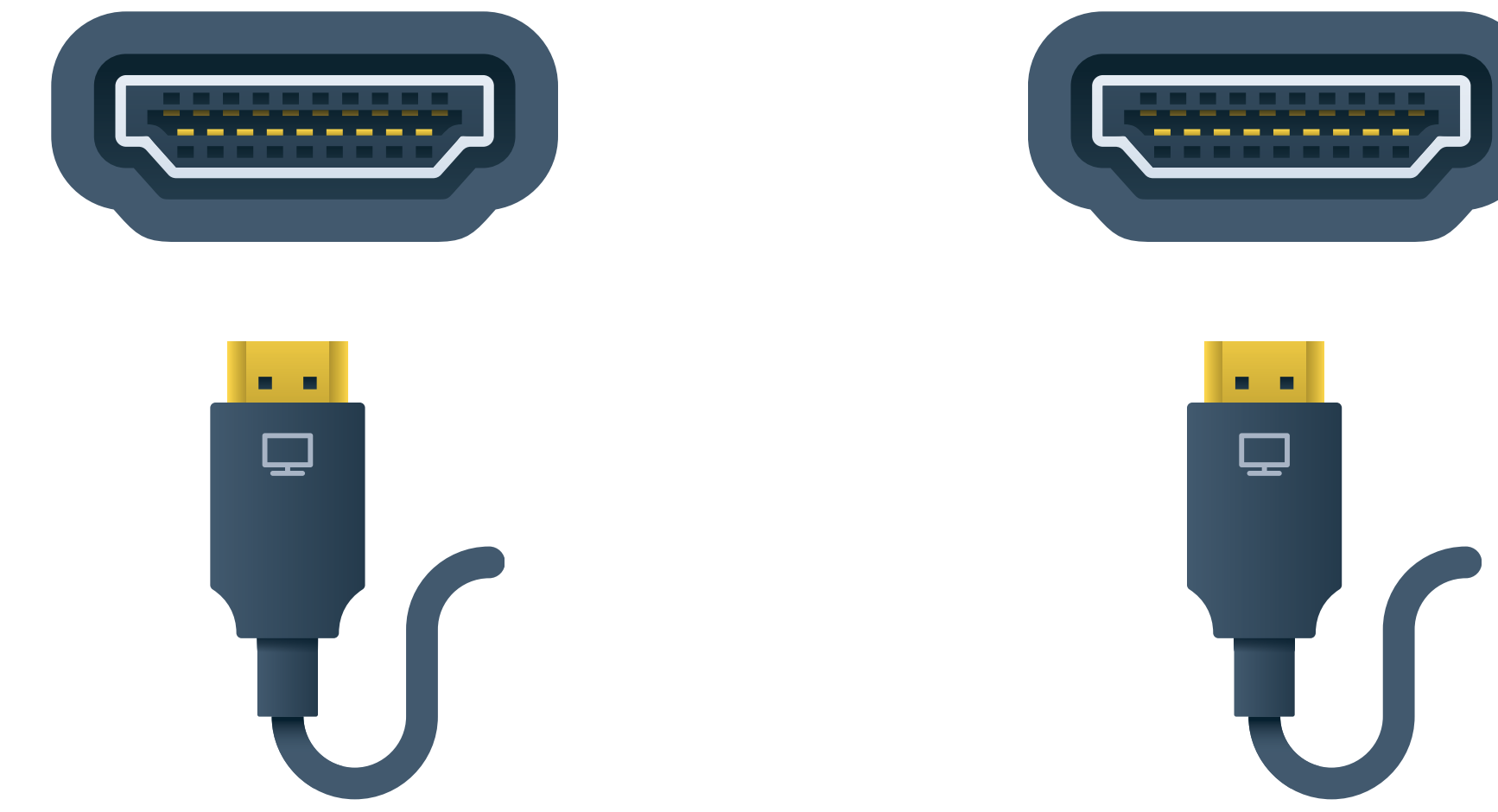
Most Consumer TV's don't do
4:4:4 at 60Hz (neither do **most**
projectors.)

Four Cables/Pathways



*Image from Extron's Distributed 4K and UDH Signals in Professional AV Environments

Two Cables/Pathways

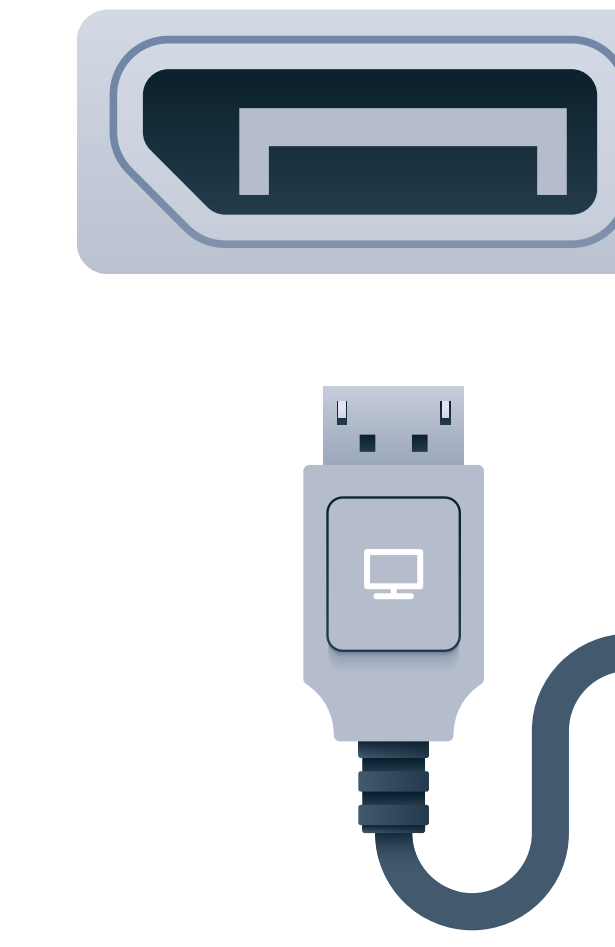
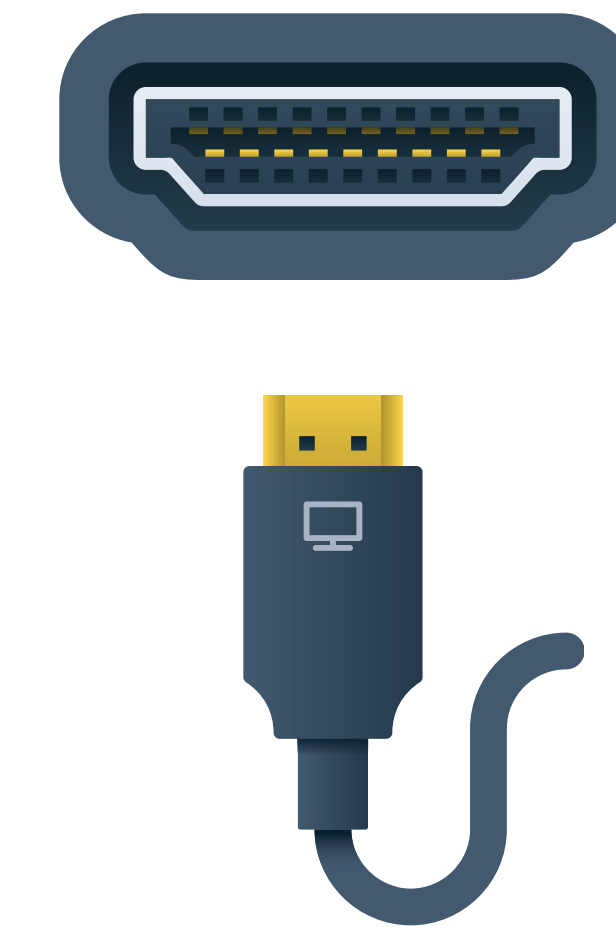
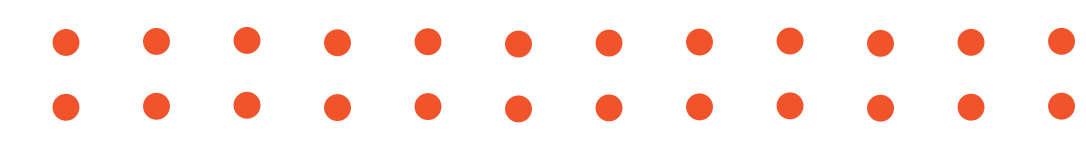


Path 1
(1920x2160)

Path 2
(1920x2160)

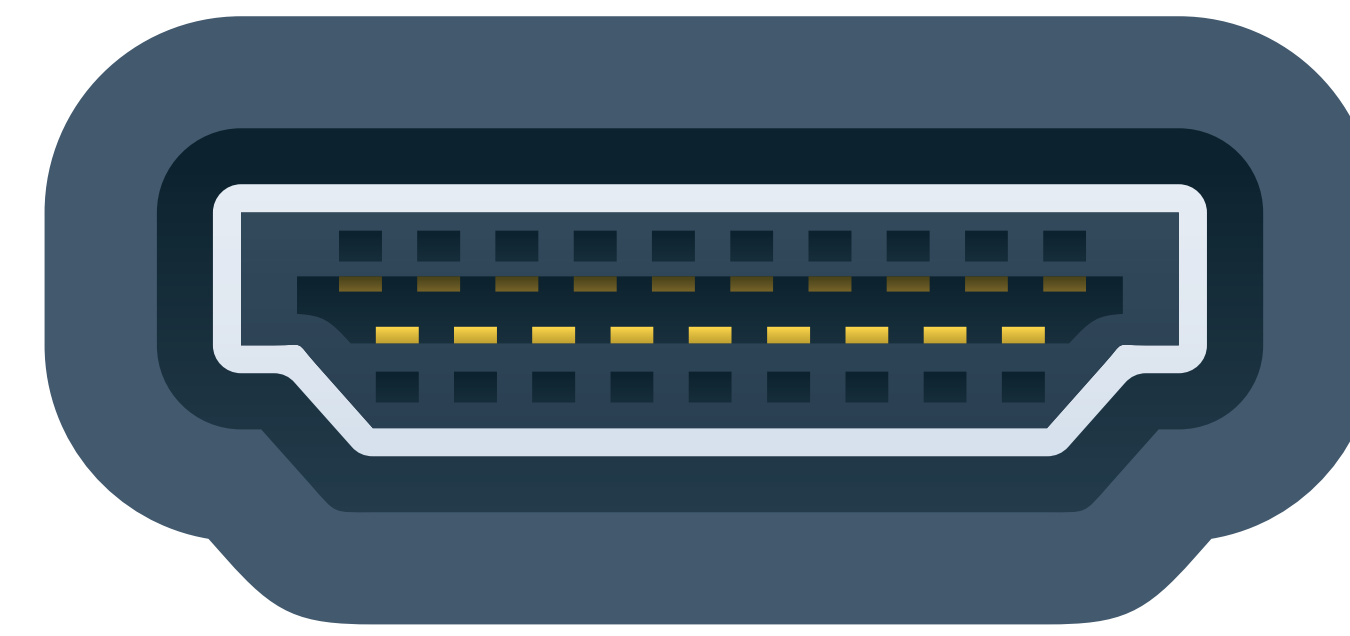
*Image from Extron's Distributed 4K and UDH Signals in Professional AV Environments

One Cable/Pathway



*Image from Extron's Distributed 4K and UDH Signals in Professional AV Environments

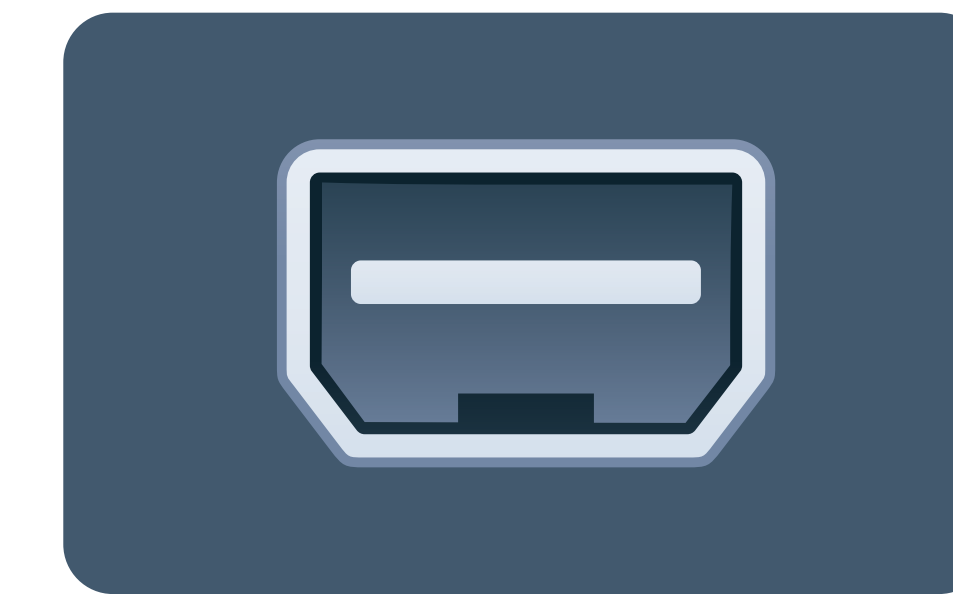
HDMI



Standard	Bandwidth	Color Sampling	UHD @ 30 Hz	UHD @ 60 Hz
HDMI 1.4a	10.2 Gbps	4:4:4 (60 Hz)	1 cable, 8-bit	2 cables, 16-bit
			4 cables, 10-bit	4 cables, 16-bit
HDMI 2.0/a/b	17.82 Gbps	4:4:4 (30Hz)	1 cable, 16-bit	1 cable, 8-bit
				2 cables, 16-bit
HDMI 2.0a/b	17.82 Gbps	4:2:0 (60 Hz)	n/a	1 cable, 16-bit
HDMI 2.1	48 Gbps	4:4:4 (60 Hz)	1 cable, 16-bit	1 cable, 16-bit

***An HDR-capable system needs at least HDMI 2.0a (18 Gbps)**

DisplayPort / Mini DisplayPort



Standard	Bandwidth	Color Sampling	UHD @ 30 Hz	UHD @ 60 Hz
DisplayPort 1.1a	10.8 Gbps	4:4:4	1 cable, 8-bit	2 cables, 8-bit
				4 cables, 10-bit
DisplayPort 1.2	21.6 Gbps	4:4:4	1 cable, 16-bit	1 cable, 10-bit
DisplayPort 1.3	32.4 Gbps	4:4:4	1 cable, 16-bit	1 cable, 12-bit
DisplayPort 1.4	32.4 Gbps	4:4:4	1 cable, 16-bit	1 cable, 12-bit

***1.4 Incorporates DSC as well as accommodates 8K @ 30Hz**



WARNING!

Future-Proof

.....

Just Video?

.....

Graphics

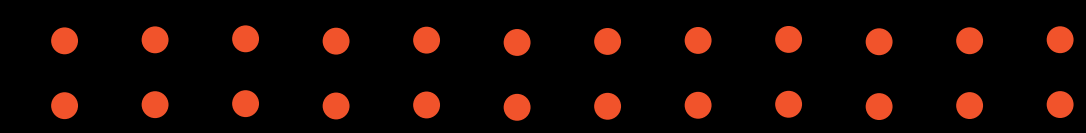
.....

A Digital Canvas?





Where will 4K be in ProAV?



Kick-Ass Images

.....

4K is Stunning

.....

It's 3D Without Glasses



4K in ProAV

The available sources and displays capable of 4K or UHD video are growing at a remarkable pace.

Home Entertainment



Huddle Room Applications

2

TOM FERRO
VAVACER

ON TO BRIDGE
3 Today's

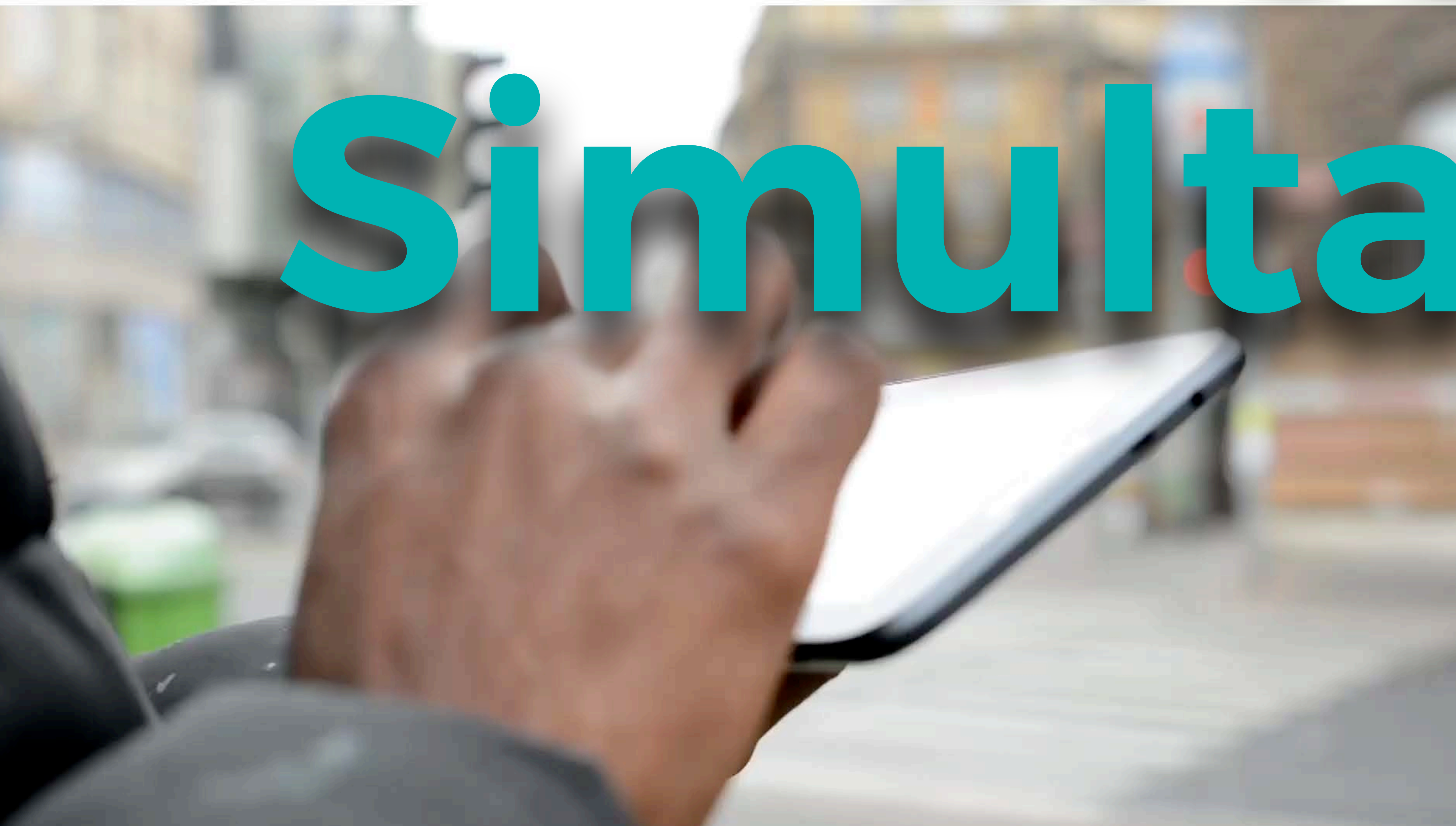
Humor > Story > Personalize

It's not rocket science.
Use some humor, tell a story, and make it personal. Three great ways to share a connection with your audience.





4x 1080p



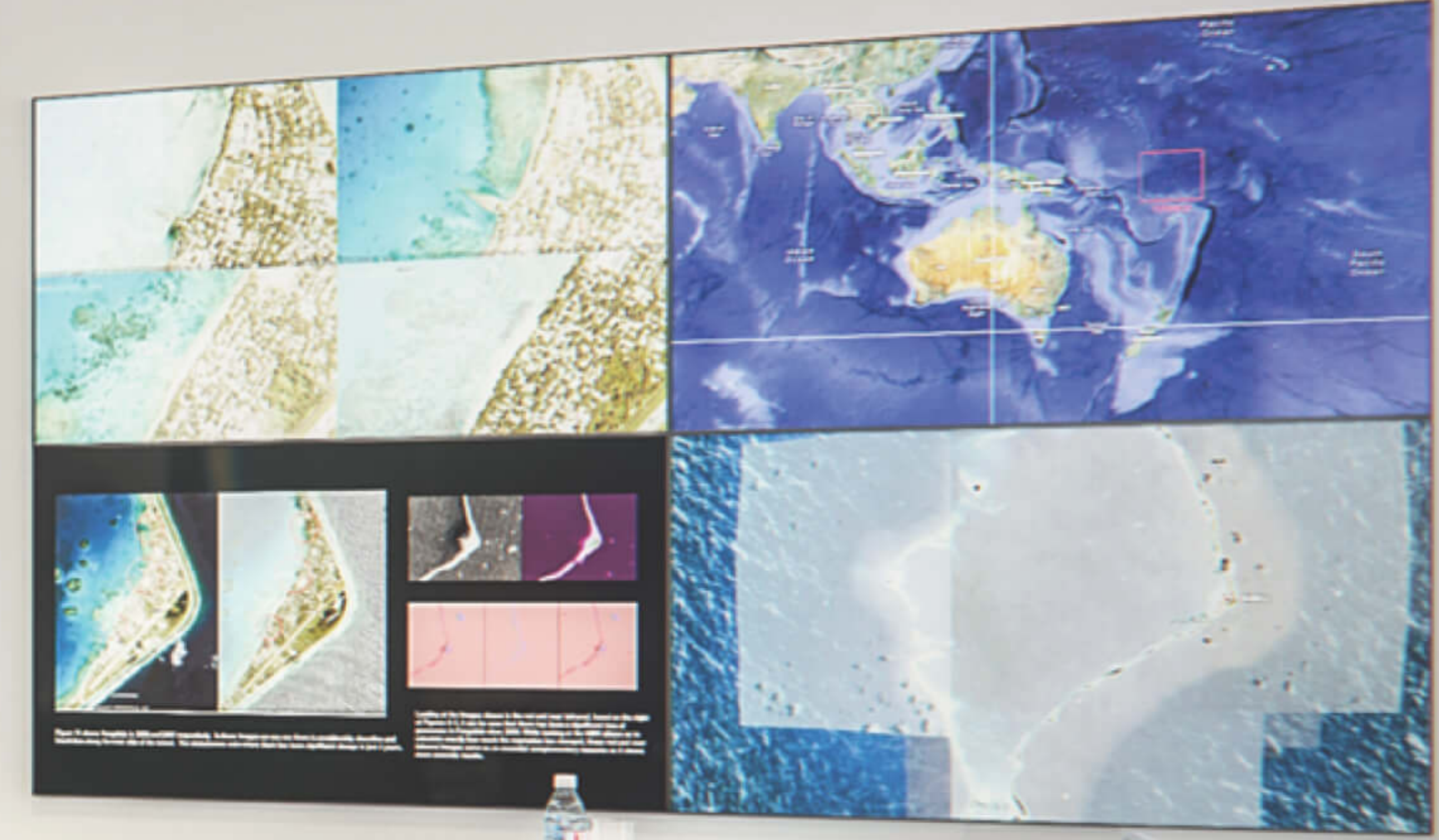
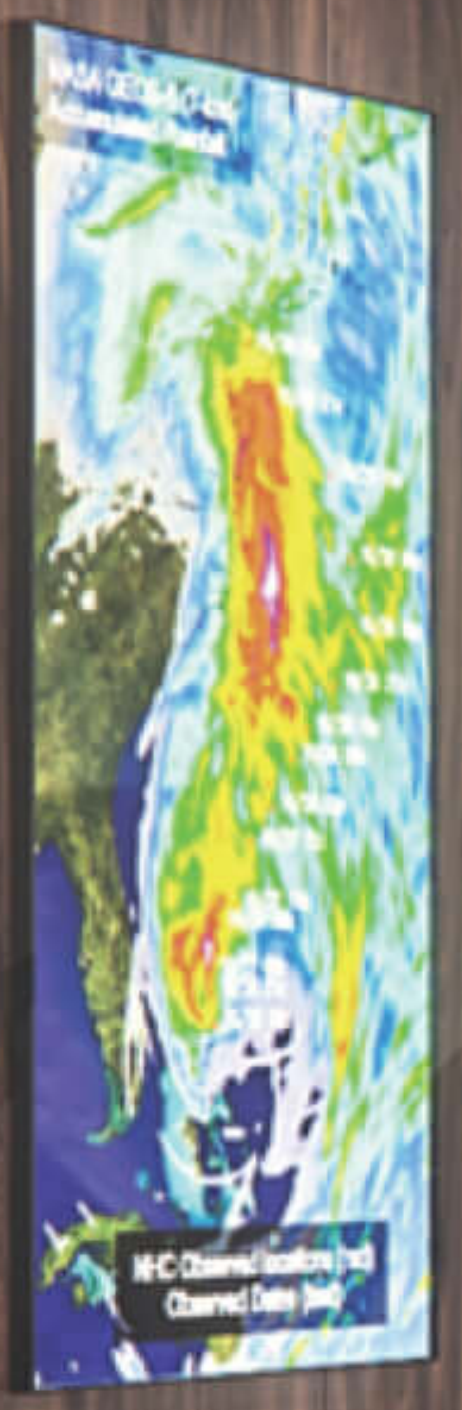
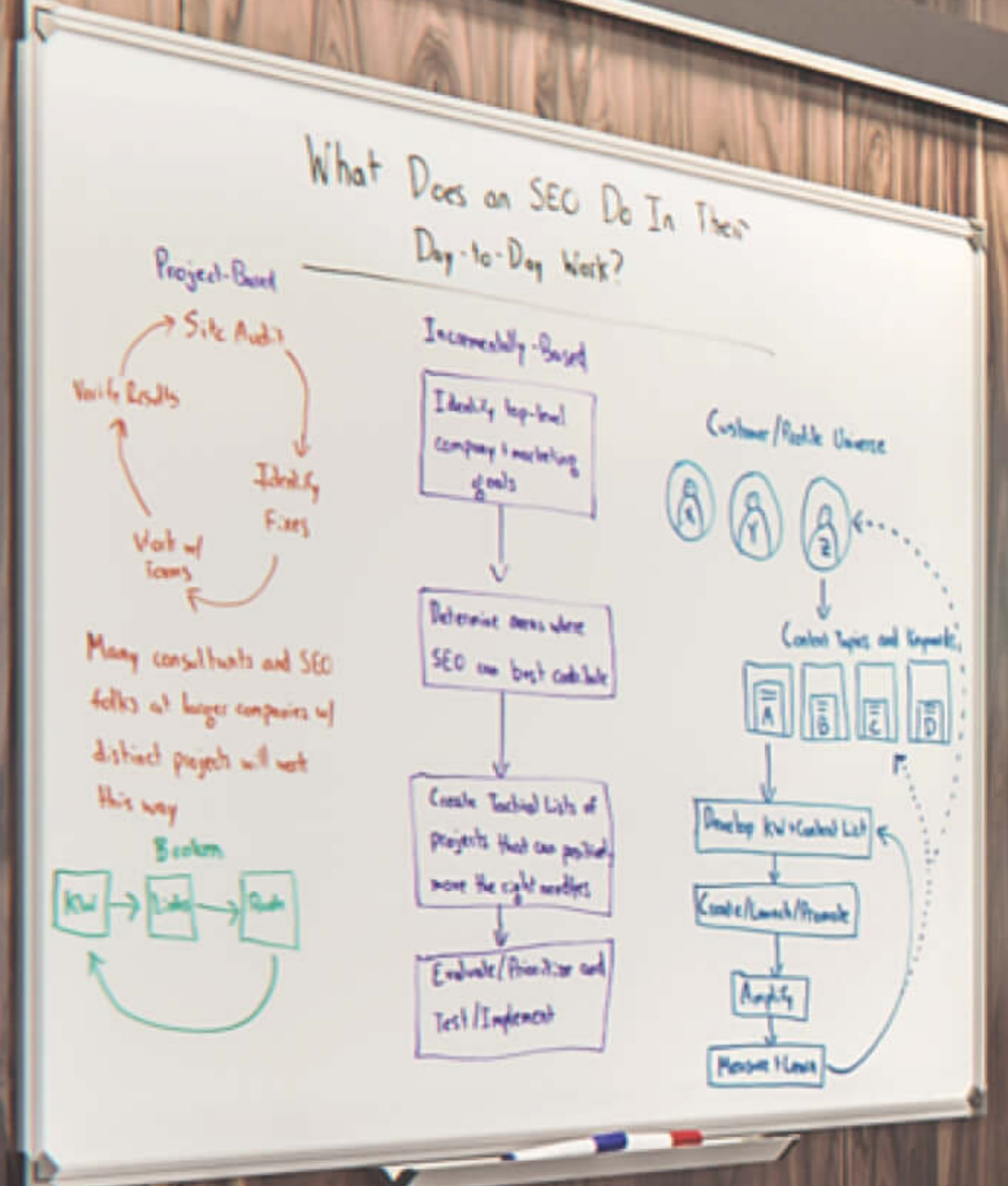
Simultaneously

**They
Wont
Buy It
From You!**

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Meeting Rooms



Boardroom



Collaboration Room

Mezzanine Logical Diagram

TRACKING SYSTEM: VTC CAMERA, VTC CODE, MEZZANINE APPLIANCE, MEZZANINE DISPLAYS, LAPTOP OR PASS-THRU, WHITEBOARD CAMERA, WHITEBOARD DISPLAYS

CONNECT TO MEZZANINE: VTC CLIENT, MOBILE DEVICE

Product Overview

1. Mezzanine Wands
2. Mezzanine appliance

Additional commercial hardware in a typical Mezzanine room includes:

3. Mezzanine Workspace
4. Mezzanine Corkboards
5. VTC Camera
6. Whiteboard Camera

Mezzanine Logical Diagram

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Timeline: 2012 Minority Report, 2013 Custom Work, 2014 Oblong Industries, 2015 TED Talk, 2016 Mezzanine™, PRESENT The Future of Work

Logos: IBM, SAP, Oracle, Microsoft, Cisco, HP, Dell, EMC, VMware, AWS, Azure, Google Cloud, LinkedIn, Facebook, Twitter, YouTube, Instagram, Spotify, Netflix, Amazon, eBay, Alibaba, Tencent, Baidu, Weibo, etc.



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Three Additions to @MeyerSound's Line of Sound Reinforcement Solutions ravepubs.com/meyer-sound-mjav

How to protect yourself & others from a failed AV system power issue. From @AVBend #avtweeps

Current Slide

PRODUCT NAME
TYPE 03

Briefly introduce your product or service

Video Content

Three analog clocks

The Digital CANVAS Concept



Digital CANVAS Classrooms!



**DigitalCANVAS
Healthcare**



DigitalCANVAS Training Rooms

electronic visualization



DigitalCANVAS Meeting Rooms!

**They
Wont
Buy It
From You!**

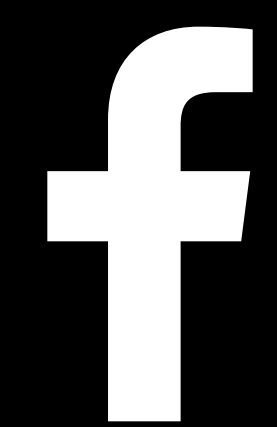
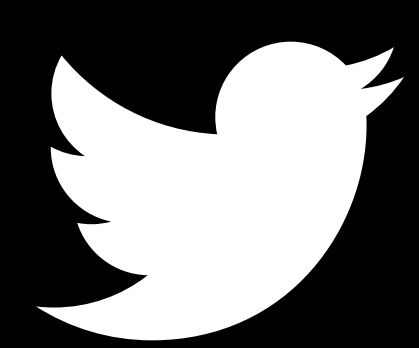


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